



# US29 Bus Rapid Transit (BRT) Improvements

## Montgomery County, Maryland

US Department of Transportation National Infrastructure Investments  
TIGER VIII Discretionary Grant Application

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## PROJECT OVERVIEW

**Project Name:** US29 Bus Rapid Transit (BRT) Improvements

**Project Type:** Premium, limited-stop Bus Rapid Transit service with managed lanes and Bikeshare

**Project Location:** Montgomery County (County), Maryland; 6th and 8th Congressional Districts of Maryland; National Capital Region Transportation Planning Board (TPB) Metropolitan Planning Organization

**Project Description:** The US29 Bus Rapid Transit (BRT) Improvements Project will transform mobility options with the implementation of a **14-mile, premium, limited-stop BRT service**. US29 BRT will be in a combination of managed lanes, Bus on Shoulder, and a small portion in mixed traffic, utilizing the existing roadway pavement when possible. This new service will improve transit travel time and increase opportunity for a broad range of users, including a significant number of minority and low-income riders living along a highly congested corridor.

The project will improve passenger transit mobility by connecting riders to high density housing and employment centers, including major job and education centers, such as the Food and Drug Administration (FDA), the National Oceanic and Atmospheric Administration (NOAA), and Discovery Communications headquarters. This project is vital to the success of significant new private development and employment in the recently adopted White Oak Science Gateway Master Plan, which includes the relocation of Washington Adventist Hospital and 300 acres of private development.

Total Project Cost: \$67,200,000

Committed Local Match: \$33,600,000 (50%)

**TIGER Funds Requested: \$33,600,000 (50%)**

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## Montgomery County DUNS number:

0620143780000

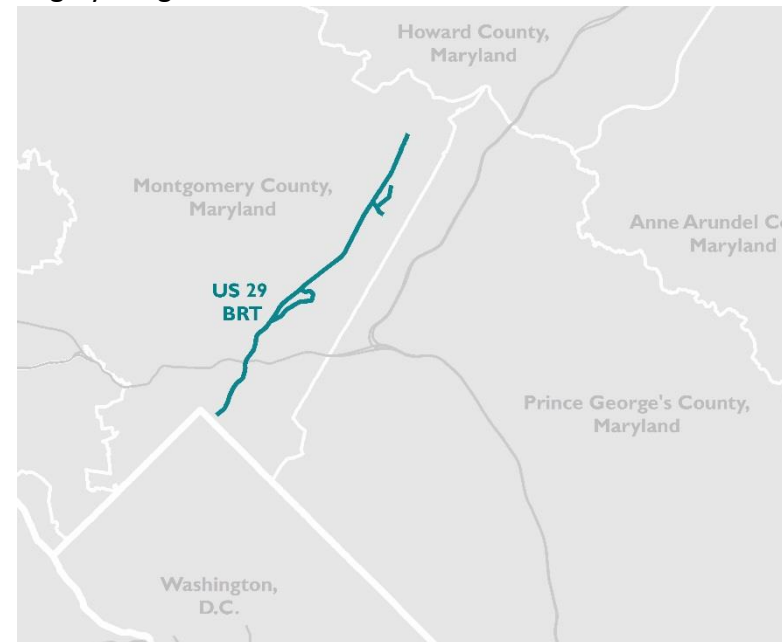


Figure 1 | US29 BRT Location



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## I. PROJECT DESCRIPTION

The US29 Bus Rapid Transit (BRT) Improvements Project will transform mobility options with the implementation of a **14-mile, premium, limited-stop BRT service** on the eastern edge of Montgomery County, Maryland. US29 BRT will be in a combination of managed lanes (HOV 2+), bus on shoulder, and a small portion in mixed traffic, utilizing the existing roadway pavement when possible. This project will improve transit reliability and opportunities for low-income and minority populations, enhance planned mixed-use redevelopment transforming an auto-oriented single-purpose development into vibrant, mixed-use urban centers, provide access to a fast-growing jobs corridor, and enhance the quality of life for over 120,000 people who live within a half-mile of this highly congested suburban corridor.

### US29 BRT CORRIDOR

Unlike other parts of the region, the US29 Corridor has not benefited from recent growth because of transportation infrastructure inadequacies. The recently approved **White Oak Science Gateway Master Plan** provides a path to bring vibrant mixed-use developments to the area. At one million people, Montgomery County has the largest population of any county in Maryland, and it's growing: after adding more than 166,000 people between 2000 and 2015,<sup>1</sup> the County is projected to add another 162,000 people between 2015 and 2040.<sup>2</sup> This fast-paced growth has spurred new investment and planning in the County's lower-density suburban auto-centric communities and corridors, aiming to increase quality of life and reduce crippling traffic congestion for both County residents and regional commuters. The US29 BRT Corridor, located on the eastern side of the Montgomery County near the borders with Howard and Prince George's County, is a critical part of that investment and planning.

The US29 BRT will link a continuous corridor of suburban centers, highway developments, shopping centers, federal offices, residential neighborhoods, regional park-and-rides, and a highly dense residential and jobs center in Silver Spring. Over 120,000 people live within half of

#### Project Key Elements

14 Miles

12 BRT  
Station  
Locations

10 New  
Bikeshare  
Stations

2 types of managed  
lanes: BOS and  
HOV 2+ with Bus

23,000  
estimated riders  
per day



a mile of US29 planned BRT stations, and the racial and income diversity of corridor<sup>3</sup> residents is indicative of the continuing diversification of suburbs nationwide. The corridor is **65 percent minority, 32 percent foreign born, and 30 percent of households classified as “very low-income.”**<sup>4</sup> As housing prices surge in neighboring Washington D.C., corridors like US29 in Montgomery County and other suburban jurisdictions have become home for previous residents of the nation’s capital, newly arrived immigrants, and others seeking more affordable residential locations beyond the Capital Beltway.<sup>5</sup>

Despite its diverse and growing population, the US29 corridor still has the infrastructure from a previous generation, including both auto-centric development and **intense traffic congestion** due to the corridor’s role as both a vital intra-county connection and a commuter route to Washington, D.C. Of the 366,000 trips per day start in the corridor area, 46 percent are single-occupancy vehicle and 10 percent are transit.<sup>6</sup>

**US29 is the busiest transit corridor in Maryland.** The regional, local, and commuter buses carry over 11,000 daily trips on the US29 Corridor.<sup>7</sup> However, bus travel on the corridor is subject to the same lengthy delays as automobiles, reducing the reliability and usefulness of transit for both commuter and non-work trips.<sup>8</sup> In fact, bus trips on the corridor are, on average 20 percent longer than automobile trips, and can be as much as 60 percent longer during peak periods.<sup>9</sup>

The process of **re-developing a 3,000 acre suburban center** along US29, the White Oak Science Gateway, into a series of mixed-use, transit-friendly developments that embrace the existing assets of the corridor while reducing roadway congestion has begun. To be truly successfully, a vital component of this redevelopment is a BRT corridor with bus on shoulder and managed lanes (HOV 2+). The US29 Corridor currently lacks a transit connection from Burtonsville to Silver Spring that can support its planned growth.

**The US29 BRT Improvement Project is the product of a multi-year planning effort to bring a high quality, convenient and reliable transit to the US29 corridor.** Montgomery County Department of Transportation’s **Countywide Bus Rapid Transit Study** (2011) recommends

## US29 Corridor

120,00+  
people

**Highly Diverse**  
65% minority  
32% foreign born

Over **12 percent** of  
households have **NO**  
**access to a car**

61,000+  
jobs

**30%** of corridor  
households earn  
**less than half of the**  
**area median income**

Bus trips on corridor  
can take up to **60%**  
**longer** than  
automobile trips





BRT for the US29 corridor, as does the [Countywide Transit Corridors Functional Master Plan](#), which was adopted in 2013. In 2014, Montgomery County Department of Transportation (MCDOT) began working with the Maryland State Highway Administration (SHA) and the Maryland Transit Administration (MTA) to study the possibility of BRT implementation on the corridor with \$3.5 million in state assistance.

In order to give community stakeholders a critical voice in the BRT system planning process, Montgomery County formed two Citizen [Corridor Advisory Committees \(CACs\)](#) for the US29 corridor. Committees, which advise on BRT design, study assumptions, transit access, coordination with other modes, public involvement planning, and community needs, helped the project team develop a [Preliminary Purpose and Needs](#) document for a US 29 Bus Rapid Transit Corridor in 2015. During US29 BRT planning, Montgomery County has incorporated other jurisdiction's goals as outlined by Washington Metropolitan Area Transit Authority's Priority Corridor Network (WMATA PCN), the TIGER I grant, and neighboring BRT plans.

**In response to the corridor's immediate need and with input from the CACs, MCDOT developed a plan to implement BRT on US29.** In early 2016, Montgomery County Executive Ike Leggett announced recommendations for better transit on the County's corridors, including \$6.5 million in the County's Capital Budget for the planning and design of a US 29 BRT on existing pavement, with the intent of "Getting this route up and running less than four years."

The US29 BRT will serve provide major links to the region's transit modes, making improved bus service on the corridor a Montgomery County priority and a regional priority. The US29 BRT will be the first BRT corridor constructed as part of Montgomery County's larger planned BRT system of more than 100 miles, designed to provide much needed relief from traffic congestion and improve the county's economic development, job creation, and the future mobility of all residents.

The planned 14-mile US29 BRT corridor will feature 12 BRT station locations in three distinct sectors of the corridor (Silver Spring, White Oak, and Burtonsville/Fairland), improving transit reliability and opportunities for low-income and minority populations, enhancing planned mixed-use suburban redevelopment, providing access to a fast-growing jobs corridor, and

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*"A Bus Rapid Transit system is **essential to achieve the vision of this Master Plan.** Improving transit service within existing corridors is intended to reduce congestion and reliance on automobiles while improving transportation capacity and meeting demands for existing and future land uses."*

-White Oak Science Gateway Master Plan

enhancing the quality of life for over 120,000 people who live on or near a highly congested suburban corridor.

## THE CORRIDOR – A SECTOR SNAPSHOT

BRT on US29 will serve three distinct sectors of the corridor: Silver Spring, White Oak, and Burtonsville/Fairland. Each of these sectors has unique characteristics, both in the built environment and use:

- **Silver Spring:** Densely built urban environment near Washington, D.C. that serves as a regional activity center with private and government jobs, social services, healthcare, a large community college campus, and access to local and regional transit, including commuter rail and heavy rail to DC, Virginia, and Maryland. With 15,000 daily boardings, the Silver Spring Metro Station is the busiest station in the County. Downtown Silver Spring has a current Non-Auto Driver Mode Share of (NADMS) 53 percent.
- **White Oak:** Transitioning from an auto-centric 3,000-acre regional activity center north of Silver Spring with over 27,000 jobs, including the Food and Drug Administration (FDA) and the White Oak Federal Research Center to an urban focused development. The White Oak Science Gateway Master Plan<sup>10</sup>, developed with community input, provides guidance for the area to be redeveloped as three walkable mixed use activity centers. US29 will be the first of three BRT corridors to serve White Oak. In addition to the FDA, the area's largest employers include a new Washington Adventist Hospital, Kaiser Permanente, Holy Cross Hospital and Comcast. White Oak is a new Transportation Management District with a NADMS goal of 30 percent for new development.
- **Burtonsville/Fairland:** Near the intersection of three Maryland counties, currently serves as a Commuter Park and Ride hub for the region; the Burtonsville Crossroads Neighborhood Plan<sup>11</sup> is helping to shape the rural/suburban area into a neighborhood center with community services. The Inter County Connector (ICC) provides an addition feeder for managed lanes and transit service.

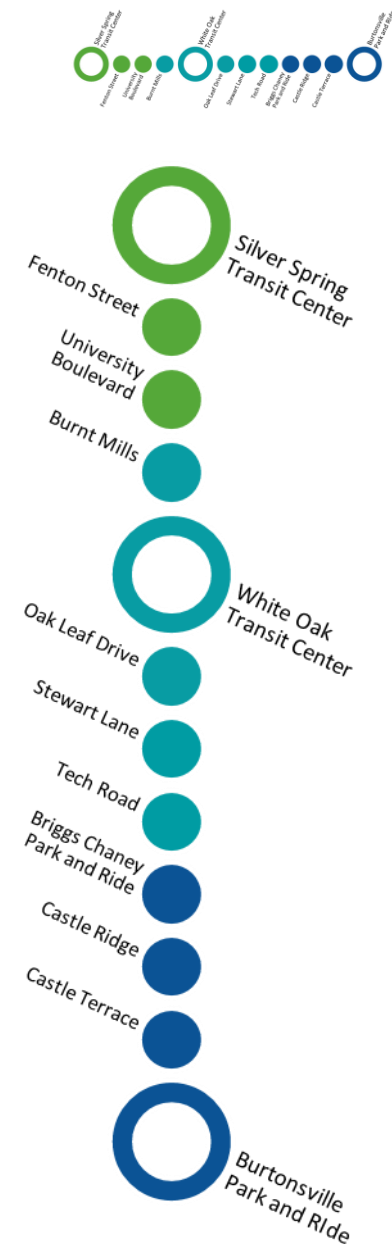


Figure 2 | US29 BRT Stations





## CORRIDOR NEEDS

### Limited Appeal of Existing Transit Services

**Transit trips currently account for 10 percent of total trips on the corridor.** The existing transit options, as well utilized as they are, are hamstrung by traffic congestion and dated, autocentric infrastructure. As transit demand and ridership in the US 29 corridor continues to grow, high-quality transit service is needed to maintain current transit riders and attract new riders. Current transit is noncompetitive when compared to automobile use for “choice” riders on the US29 corridor. Without an attractive system, the amount of automobile travel will increase, which leads to greater traffic congestion and reduced bus performance and greatly detracts from the vision of the White Oak Science Gateway.

### Roadway Congestion and Safety

Traffic congestion currently impedes bus and rider mobility and results in unpredictable bus service, longer travel times, and delayed schedules. Corridor-wide enhancements to address efficiency and reliability are needed to improve mobility for transit riders. Currently, bus travel times along the corridor take, an average, over 20 percent longer than automobile trips, with some segments reaching as high as 60 percent longer.<sup>12</sup> White Oak has limited options for new vehicular connections. This area is particularly constrained by existing development, ownership patterns, the large federal property, and environmental resources. These physical constraints limit opportunities to improve circulation and connectivity, which forces all local traffic onto the major highways.

### System Connectivity

A high-quality, continuous transit service from Silver Spring to Burtonsville that can support the surrounding mixed used development along the corridor is needed to connect transit customers to local and regional employment and activity centers. The US29 corridor serves as both a **job location**, with 61,000 jobs along the corridor in 2010 (projected to over 81,000 in 2040), and a **job connection** to the more than 3.8 million jobs in the greater Washington, DC region. Transit service is essential to support future the development of mixed-use communities along the corridor, including the planned White Oak Science Gateway

The *US29 Purpose and Need* document is the product of working with our Citizen Corridor Advisory Committees (CACs) for over a year.

### Statement of Need

- | Limited appeal of existing transit services despite a strong market for transit trips
- | Roadway congestion and safety
- | Limited connectivity of facilities for pedestrians and bicyclists
- | Planned growth within the study area
- | Transit-dependent community with limited options for mobility



development. The US29 BRT will have ridership in both directions during the peak period due to the growing job market in White Oak as well the traditional suburban commute to downtown.

## Quality of Life

Transit improvements are needed throughout the US 29 corridor to create a transportation network that enhances choices for transportation users and promotes positive effects on the surrounding communities and residents' quality of life. Twelve percent of households on the corridor do not have access to a car, and an additional 38 percent of households on the corridor only have access to one car.<sup>13</sup> Median income is 22 percent below the County average in the White Oak Science Gateway area and 42 percent of bus riders use more than 30 percent of their income on housing costs. A 2014 Washington Post profile of the increasing poverty in the eastern edge of Montgomery County notes that "[t]he economic downturn in Montgomery was accompanied by record immigration, with many newcomers leaving white-collar jobs in their home countries only to find few decent job opportunities here. Meanwhile, rents in the District and close-in suburbs spiked faster than outside the Capital Beltway, and government voucher programs made the suburbs more accessible to the poor. *But accessible does not necessarily mean hospitable.* From Briggs Chaney Road, the Silver Spring Metro station is nine miles away, connected by a bus route that can take more than 45 minutes." (emphasis added)<sup>14</sup>

## HOW BRT CAN HELP

### Improve the Quality of Transit Service

US29 BRT will improve the quality of transit service by increasing travel speed, reliability, frequency and ease of use thus better serving existing riders and attracting new riders.

- Reconfigure the Road: US29 BRT will be implemented within existing right of way (ROW). As shown in Figure 3, regionally appropriate BRT

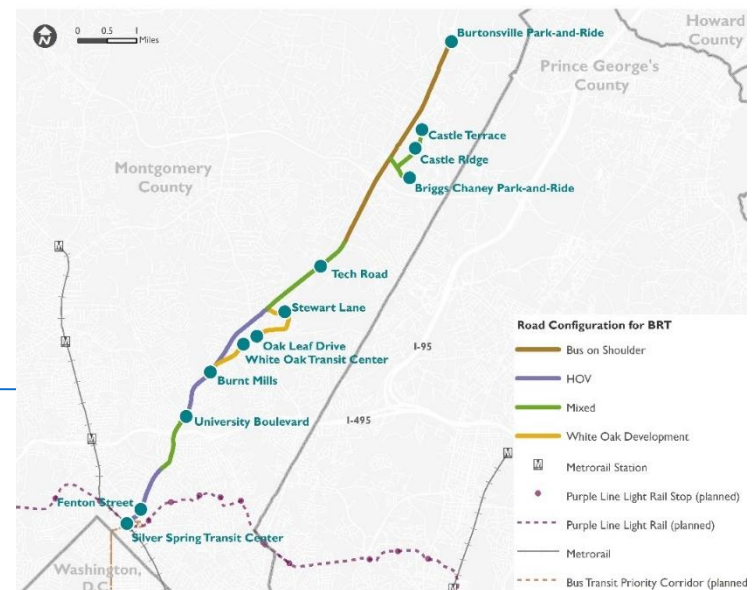


Figure 3 | US29 BRT Corridor Road Configuration



road configurations for the corridor include managed lanes, bus on shoulder, and limited mixed traffic.

- **Transit Signal Priority (TSP):** Transit signal prioritization and signal coordination will reduce passenger travel times and make transit a more competitive transportation option along US29. TSP has been recommended at 15 intersections.
- **BRT Stations:** The system will feature a total of 17 stations in 12 locations. Level-boarding and off-board fare payment will reduce bus dwell time and increase speed of service. Other station amenities, including canopies and real time travel information screens will enhance the passenger travel experience.
- **New and existing riders:** In 2020, the US29 BRT is expected to have 17,000 daily weekday riders, 4,460 of which will be new transit riders shifting from autos. In 2040, this grows to 6,088 new riders and 23,000 boardings.<sup>15</sup>

### Improve Mobility Opportunities and Choices

US29 BRT will improve mobility options and choices by strengthening the north/south transit connectivity to existing and proposed transit systems and major employment and activity centers thus improving neighborhood, local and regional connectivity.

- **Increased access to job opportunities:** The US29 BRT corridor has over 61,000 jobs today, including **13,500 federal jobs**, and is projected to have 81,000 jobs by 2040. The metropolitan region has over 3.8 million jobs today, and is projected to have over 5.4 million jobs by 2040.
- **Transit connectivity:** The US29 BRT will provide major links to the region's transit modes, including the Red Line on the Metrorail system, MARC Commuter Rail, numerous county and intercity bus routes; commuter buses; planned Bus Transit Priority Corridor in Washington, D.C.; and the future Light Rail line (the Purple Line) connecting the outer edges of the Metrorail system. US29 will be the first of three planned BRT corridors to serve White Oak area. Additionally, Montgomery and Howard Counties are exploring a future bi-county service expansion.

### Project Goals

- | Improve the quality of transit service
- | Improve mobility opportunities and choices
- | Enhance quality of life
- | Support master planned development
- | Sustainable and cost effective

**13,500 Federal  
Jobs in White  
Oak and Silver  
Spring**



- Pedestrian and Bike Access: Ten new Capital Bikeshare stations will further connect the US29 corridor to Capital Bikeshare's 350 stations throughout Montgomery County, Washington, D.C., Arlington, Virginia, and Alexandria, Virginia, including 58 bikeshare stations in the County. Montgomery County offers low-income residents free Bikeshare memberships, training, helmets, and route planning.

### Enhance Quality of Life

US29 BRT will enhance quality of life by improving access to housing and jobs and better serving transit demand and transit dependent populations.

- Upward Mobility: US29 BRT biggest impact will be felt among those who rely on the service to access jobs and other social services. A Harvard Study showed that commute times were the single strongest factor in the odds of escaping poverty.<sup>16</sup> In the short term, faster service on US29 will reduce travel times and provide transit dependent populations more flexibility in their daily lives. In the long term, the US29 BRT will create the framework for upward mobility.
- Better Access: The US29 BRT corridor will provide immediate, positive benefits to the diverse populations living along the corridor. Within approximately a ½ mile of US29 BRT stations, residents will have access to **six** public schools, **one** regional community college campus, **four** community and recreation centers, **two** Regional Service Centers, which coordinate Montgomery County

## Ladders of Opportunity

For residents along the corridor, US29 BRT will

- | Increase transit access and reliability
- | Increase regional connections and access to a fast-growing jobs corridor
- | Support mixed-use developments in suburban corridors (reducing the need for a vehicle to access critical services)
- | Improve quality of life through decreased travel times and congestion-related negative impacts, such as greenhouse gas emissions.

## US29 is a snapshot of America's increasingly diverse suburban areas

The census block groups and tracts within ½ mile of planned US29 BRT stations are:

- | 65% minority
- | 32% foreign born
- | 30% Very Low Income (Households with an annual income of less than \$30,000)
- | 12% of households have access to zero vehicles
- | 38% of households have access to only one vehicle
- | 31% of those over the age of 5 speak a language other than English at home
- | Home to over 9,000 senior citizens and over 11,000 people with disabilities



direct service delivery, focusing on the particular needs of each region, **three** public libraries, **five** health centers providing healthcare for low-income families and 61,000 jobs, including jobs at **nine** federal offices and **16** shopping centers.

### Support Master Planned Development

US29 BRT will support master planned smart growth development.

- White Oak Science Gateway: This project is vital to the success of significant new private development and employment in the recently adopted White Oak Science Gateway Master Plan, which includes the relocation of Washington Adventist Hospital, the consolidation of the Food and Drug Administration (FDA) at the White Oak Federal Research Center (FRC), and 300 acres of private development. In addition to the FDA, which now has 8,100 employees on site, the area's largest employers include Washington Adventist Hospital, Kaiser Permanente, Holy Cross and Comcast.<sup>17</sup>

### Sustainable and Cost Effective

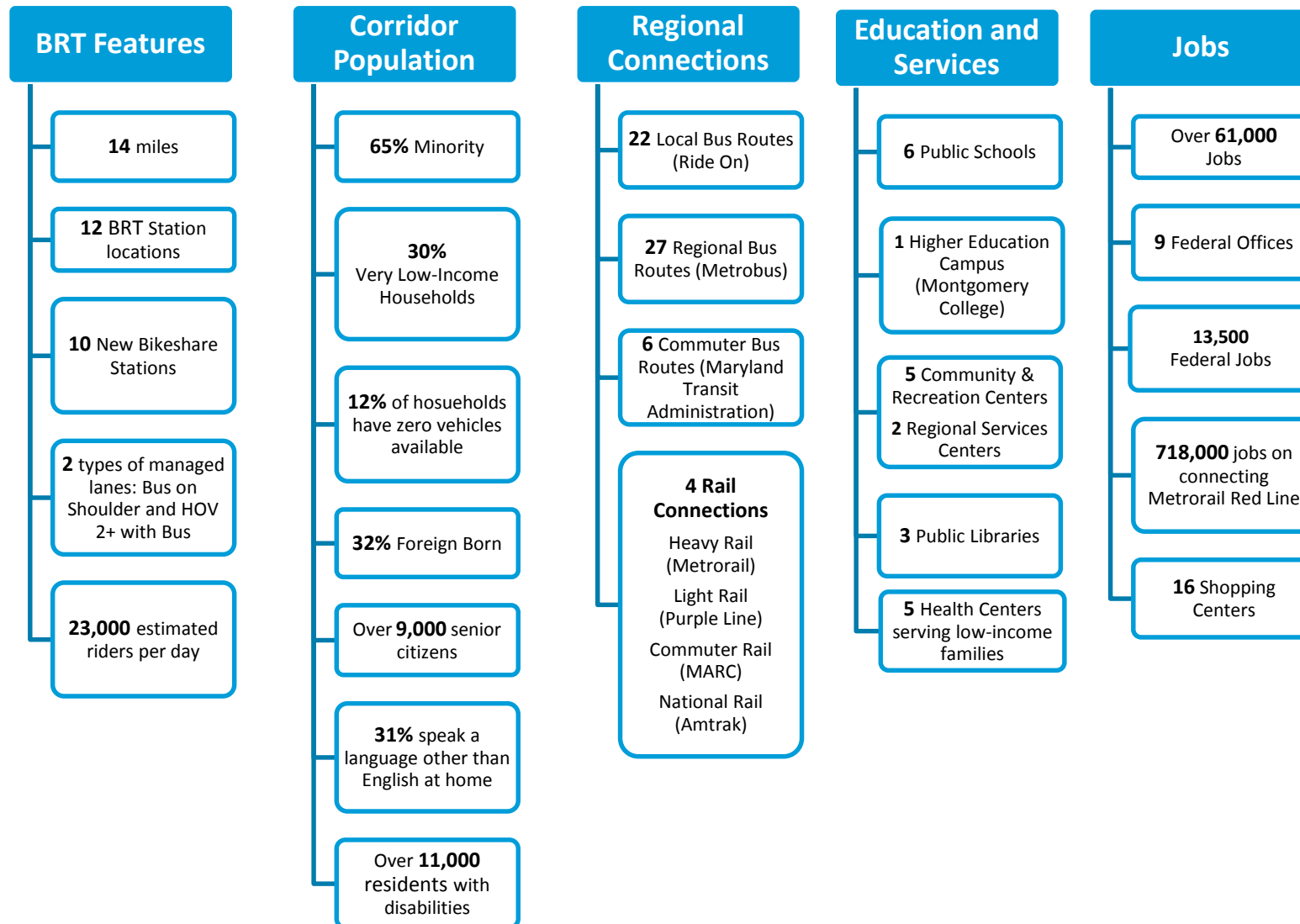
US29 BRT is a sustainable and cost effective transportation solution that addresses both physical and financial constraints.

- Minimal Impacts: In an effort to capitalize on existing assets and minimize impacts, US29 will be implemented primarily within existing right of way (ROW). In select locations, stations may be built outside of the existing curbs and may require additional ROW.
- Better Health: US29 BRT will improve air quality by reducing regional auto vehicle miles traveled (VMT) and related emissions. In 2040, the BRT will result in an average weekday savings of 33,489 VMT and an average annual savings of 9,711,752 VMT. The resulting value of the air quality savings is approximately \$1.16 million (at a 3 percent discount).

**"BRT is crucial to Montgomery County's future if we are to reduce traffic congestion, spur business growth and attract a talented workforce to build on our innovative economy, provide affordable transportation options for people of all incomes, create a reliable intra-county bus rapid transit system and fight climate change through reduced greenhouse gas emissions. Many of our current plans for walkable, livable new mixed use communities hinge on providing a robust and efficient transit system."**

-Ike Leggett, County Executive







## II. PROJECT LOCATION<sup>18</sup>

The proposed 14-mile US29 Bus Rapid Transit (US29 BRT) runs along US Route 29 in eastern Montgomery County, Maryland. Montgomery County is located just north of Washington, D.C., and is an integral part of the economic, social, and political fabric of the Washington DC Metropolitan Area. The county is part of the Metropolitan Planning Organization's National Capital Region Transportation Planning Board and the Washington-Baltimore-Northern Virginia Combined Statistical Area, which has a population of more than 9 million people. Montgomery County is the most populous county in the state of Maryland with over 1 million residents, and it is the second most populous county in the metropolitan region.

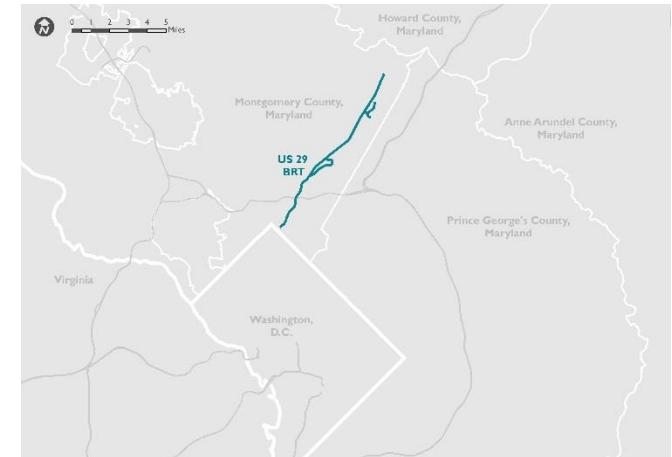
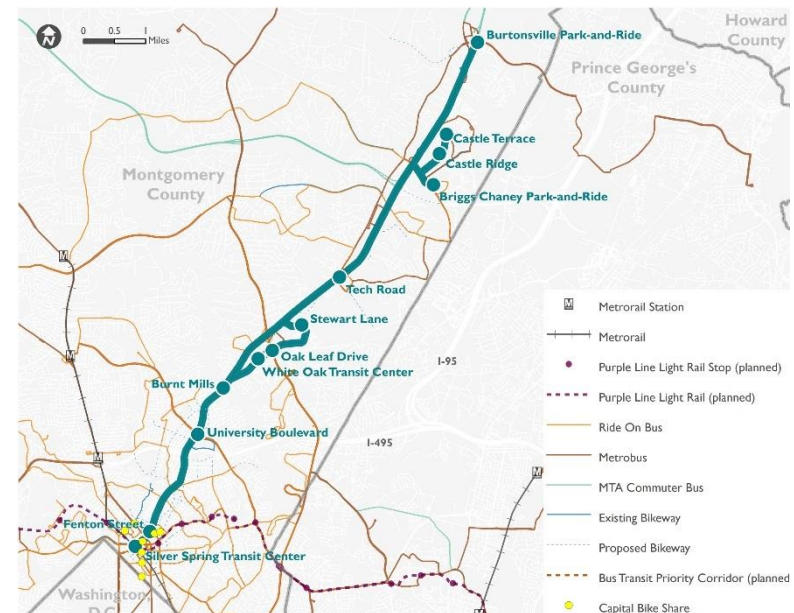


Figure 4 | US29 BRT Location

**Montgomery County's high median income masks the social and economic factors at play in eastern Montgomery County.** While the western section of the county has flourished, the eastern section has suffered from a legacy of disconnection, as well as the effects of the recent economic recession. The US29 corridor is the prime example, as cited by a 2014 Washington Post article, "In 2000, none of the county's census tracts had more than an 18 percent poverty rate. Now, even as \$3 million condos sprout in Bethesda, there are 12 tracts exceeding that benchmark, including the Briggs Chaney neighborhood east of Route 29, near the Prince George's County line."<sup>19</sup> The US29 BRT will travel through a diverse set of neighborhoods ranging from rural Burtonsville to suburban White Oak to urban Silver Spring. The demographics of the corridor range from very low income to above the median income level. The US29 BRT will connect these diverse populations and landscapes to provide the most in need populations with access to the more than 3.8 million jobs in the greater Washington, D.C. region.

Figure 5 | US29 BRT Transit Connections





The US29 BRT will directly serve Silver Spring and White Oak, major regional activity centers, which are home to three of the county's largest employers: the U.S. Food and Drug Administration (FDA), with over 13,000 employees; the National Oceanic and Atmospheric Administration (NOAA), with over 4,600 employees; and Discovery Communications, a Fortune 500 company, with over 1,500 employees. The corridor will only continue to grow, with job growth in Silver Spring and White Oak estimated to be over 80 percent by 2040. Montgomery County supports economic development and growth with transit infrastructure, such as that envisioned in the Countywide Transit Corridors Functional Master Plan, and by offering many competitive business resources including "Fast Track" permitting. These policies ensure the US29 BRT project generates sustainable growth by attracting businesses that are accessible to all populations regardless of income level or background.

Along the corridor, US29 transforms from an urban road in Silver Spring to a six-lane divided expressway with existing Bus on Shoulder lanes north of MD200. The US29 BRT project will transform US29, the only US Route in the County, from auto-centric to a transit oriented roadway that provides transit connections to the corridor, the County, and the region. The US29 BRT will provide vital transit connections to 22 local buses, six Commuter Buses, Metrorail, MARC Commuter Rail, and Amtrak on one of the most congested and failing road corridors in the region (see **Figure 5**). The US29 BRT will also provide future connections to the Purple Line Light Rail Line, which is scheduled for construction in 2016, providing inter- and cross-county connections, and the US29 BRT will provide a link between Howard County's and Washington, D.C.'s US29 BRT systems. These numerous transit connections provide the corridor and the region's diverse, low-income transit dependent populations with affordable, safe, and reliable access to one of the country's fastest growing job and housing markets.

### III. PROJECT PARTIES

The US29 BRT project will be constructed and operated by **Montgomery County Department of Transportation (MCDOT)**. This project is part of an on-going partnership with the **Maryland Department of Transportation**, which has been studying the proposed Montgomery County Bus

#### US-29 BRT Corridor

14 Neighborhoods

2 Major Activity Centers

3 of the County's Largest Employers

122,560 People

47,257 Households

65% Minority

30% of Households are "Very Low Income"

15,000 Daily Bus Riders

46% of daily trips are SOV

10% of daily trips are Transit



Rapid Transit. MCDOT will oversee all aspects of the project and will coordinate closely with all project parties.

### Montgomery County Department of Transportation (MCDOT)

MCDOT will oversee all aspects of the project and will coordinate closely with all project parties. MCDOT has 1,345 Employees and an annual operating budget of \$205 million.

### Maryland State Highway Administration (SHA)

SHA, part of the Maryland Department of Transportation, maintains, improves and develops state highways and roads and ensures safe driving conditions for Maryland citizens. SHA will be a close coordinating partner, with participating roles in planning, engineering, and Bikeshare. SHA will have a leading role in roadway construction for bus on shoulder portions of the roadway and in signal design.



Figure 6 | Montgomery County RideOn Buses

### Maryland Transit Administration (MTA)

MTA, part of the Maryland Department of Transportation, provides commuter rail, commuter bus, and mobility services to Maryland citizens. MTA will be a close coordinating partner, with participating roles in bus operations, real time transit information (RTTI) displays, fare collection and outreach and marketing. MTA will also provide coordination with the Purple Line.

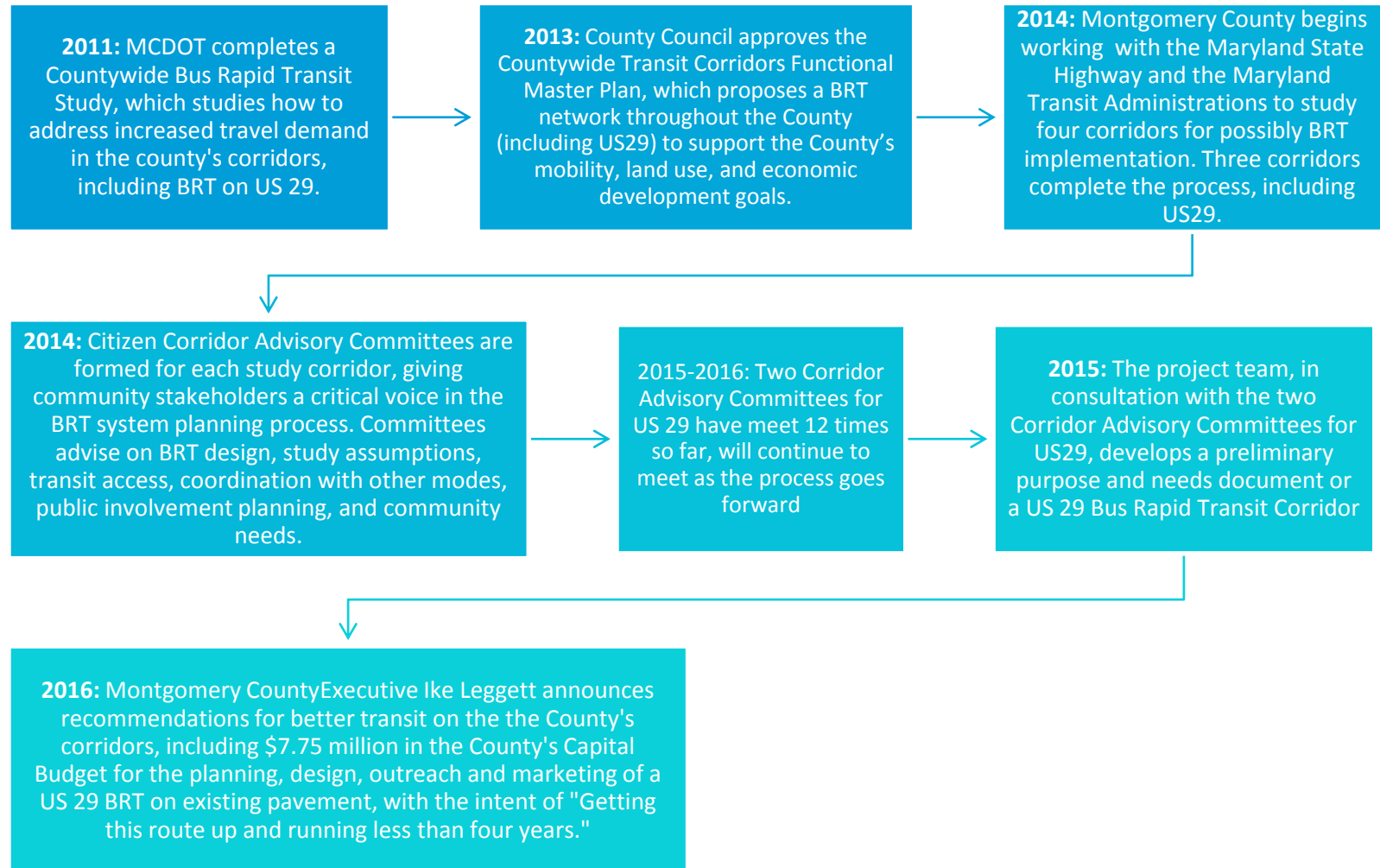
### Washington Metropolitan Area Transportation Authority (WMATA)

WMATA operates Metrobus, Metrorail, and MetroAccess. WMATA will close coordinating partner, with participating roles in bus operations, real time transit information (RTTI) displays, fare collection to ensure system integrations.

	MCDOT	MDOT		WMATA	Howard
		SHA	MTA		
Planning	L	P	C	C	C
Engineering	L	P	C	C	C
Bus Operations	L	C	P	P	C
Roadway	L (ML)	L (BOS)	C	C	C
Signals / TSP	L (operate)	L (design)	C	C	C
Stations	L	C	C	C	C
RTTI Displays	L	C	P	P	C
Fare Collection	L	C	P	P	C
Outreach and Marketing	L	C	P	C	C
Bikeshare	L	P	C	C	C
L = Leading; P = Participating; C = Coordinating with ML = Managed Lanes, BOS= Bus on Shoulder					



## BRT on US29: Vetted, with Strong Community Support







## IV. GRANT FUNDS AND SOURCES/USES OF PROJECT FUNDS

MCDOT is requesting \$33.6 million in TIGER VIII funding or approximately 50% of the total project cost. Local matching funds of \$33.6 million will be provided by Montgomery County, Maryland. The County Executive's FY17-22 recommended budget includes \$7.75 million in FY17 and FY18 for planning, design, outreach and marketing of the US29 BRT. Montgomery County will program the remaining funds upon successful award.

Additionally, Montgomery County will provide a "soft match" in the form of annual operating costs, which are estimated to be \$5.2 million per year. To-date, MDOT has funded \$3.5 million towards the preliminary planning of BRT on this corridor.

Description of Scope	% of Total Cost	Estimated Cost
BRT Stations and Stops	12%	\$ 8,232,708
Transit Signal Priority (Design & Install)	1%	\$ 860,000
Vehicles	19%	\$ 13,000,000
Bicycle & Pedestrian Improvements	4%	\$ 2,355,000
Roadway Improvements	49%	\$ 33,000,000
Marketing & Outreach	2%	\$ 1,250,000
Planning/Design Cost	10%	\$ 6,500,000
Overhead-& Grant Administration (3%)	3%	\$ 1,955,931
<b>Total Cost</b>		<b>\$ 67,153,639</b>
<b>Local Match</b>	<b>50%</b>	<b>\$ 33,576,820</b>
<b>TIGER Request</b>	<b>50%</b>	<b>\$ 33,576,820</b>

**"BRT is crucial to Montgomery County's future if we are to reduce traffic congestion, spur business growth and attract a talented workforce to build on our innovative economy, provide affordable transportation options for people of all incomes, create a reliable intra-county bus rapid transit system and fight climate change through reduced greenhouse gas emissions. Many of our current plans for walkable, livable new mixed use communities hinge on providing a robust and efficient transit system."**

-Ike Leggett, County Executive





Detailed Project Costs	Unit Cost	Units	Estimated Cost
<b>BRT Stations and Stops</b>			<b>\$ 8,232,708</b>
Concrete Pad	\$ 45,000	17	\$ 765,000
Canopy	\$ 248,624	17	\$ 4,226,608
Real Time Passenger Information (RTPI) Signs	\$ 21,300	18	\$ 383,400
Right-of-way and Easements	\$ 50,000	17	\$ 850,000
Off Board Fare Collection Equipment	\$ 106,500	17	\$ 1,810,500
Benches	\$ 6,800	17	\$ 115,600
Trash Receptacles	\$ 3,200	17	\$ 54,400
Bike Racks	\$ 1,600	17	\$ 27,200
<b>Transit Signal Priority (Design &amp; Install)</b>			<b>\$ 860,000</b>
Field Hardware & Install (including engineering)	\$ 35,000	15	\$ 525,000
Vehicle Hardware & Install (including engineering)	\$ 20,000	13	\$ 260,000
Software & Licensing	\$ 75,000	1	\$ 75,000
<b>Vehicles</b>			<b>\$ 13,000,000</b>
Bus - BRT Articulated (including CAD/AVL and Fare Collection Technology)	\$ 1,000,000	13	\$ 13,000,000
<b>Bicycle &amp; Pedestrian Improvements (&amp; Install)</b>			<b>\$ 2,355,000</b>
Bicycle Parking - Covered	\$ 15,000	17	\$ 255,000
Bikeshare Station (Bikes & Docks)	\$ 80,000	10	\$ 800,000
ADA Sidewalk upgrades (Linear Feet)	\$ 200	6,500	\$ 1,300,000
<b>Roadway Improvements</b>			<b>\$ 33,000,000</b>
Signing and Marking of BAT and HOV Lanes (lane miles)	250,000	22	5,500,000
Signal changes for BAT Lane	\$ 500,000	15	\$ 7,500,000
Bus on Shoulder Burtonsville to Tech Road (lane miles)	2,000,000	10	20,000,000
<b>Marketing &amp; Outreach</b>			<b>\$ 1,250,000</b>
Marketing & Outreach	\$ 1,250,000	1	\$ 1,250,000
<b>Planning/Design Cost</b>			<b>\$ 6,500,000</b>
Planning/Design Cost	\$ 6,500,000	1	\$ 6,500,000
Subtotal			\$ 65,197,708
Overhead-& Grant Administration (3%)			\$ 1,955,931
<b>Total Cost</b>			<b>\$ 67,153,639</b>

The County Executive's FY17-22 Capital Improvements Program recommends \$1.2 billion in transportation capital expenditures, including \$7.25 million for US29 BRT. The remaining funds will be programed upon successful award.

**50%**  
match

## V. SELECTION CRITERIA

The US29 BRT project is well-aligned with the TIGER Discretionary Grant program selection criteria, providing both long-term and short-term benefits to Montgomery County and the surrounding region. In the short-term, this project will provide economic stimulus to the region via creation of construction jobs. In the long-term, this project will provide a new link to the multimodal transportation network, thus reducing operating costs, travel times, vehicle exhaust emissions and other environmental benefits compared with the current conditions. At the same time, the BRT will increase job opportunities, economic competitiveness, and improve livability in the County and National Capital Region by stimulating development of this key corridor into a vibrant, mixed-use, and inclusive community.

### Primary Selection Criteria

The corridor's suburban landscape currently encourages automobile usage which further degrades the corridor's vitality. The US29 BRT will redefine the suburbs by creating a sustainable, inclusive, and accessible landscape. By improving transit service on the corridor, the disadvantaged populations who do not have access to automobiles will finally have reliable, fast, and safe access to the corridor and region's opportunity.

### STATE OF GOOD REPAIR

The US29 BRT project reflects Montgomery County's dedication to improving and maintaining its existing transportation facilities. A transportation system in a state of good repair creates a built environment that inherently promotes the success of all people. The bus purchase component of the US29 BRT project will enable the County to purchase 13 articulated buses. Smaller bus shelters will be replaced at stops with larger, newer stations with enhanced amenities including real-time transit information screens, off-board fare collection, and level-boarding platforms to accommodate increased ridership. Ride On's state-of-the-art maintenance and operation facility (which opened in October 2013) has capacity to service and maintain the proposed fleet expansion. [County's Ride On bus system](#) consists of 337 County owned and operated buses on 78 routes. Ride On has an annual ridership of approximately 27 million and a daily average of 88,000 riders.



## ECONOMIC COMPETITIVENESS

This project meets the USDOT's goals for the provision of "ladders of opportunity" by creating and improving connections between people and centers of employment, education, and services while removing barriers to connected systems of transportation. Specifically, the US29 BRT project will spur sustainable and equitable development and redevelopment of non-transit-oriented suburban spaces.

### Reduce Congestion and Increase Movement of People

The US29 BRT system will facilitate the efficient movement of people and provide viable alternatives to the automobile. In 2020, the US29 BRT is expected to have 17,000 daily weekday riders, 4,460 of which will be new transit riders shifting from autos. In 2040, this grows to 6,088 new riders and 23,000 boardings.<sup>20</sup>

### Increase Transit Oriented Development in Suburban Areas

The US29 BRT will connect suburban White Oak and rural Burtonsville to Silver Spring, which serves as a model for the county's successful ability to transform suburban landscapes into sustainable and equitable transit oriented developments. The White Oak Sector Plan envisions a walkable and livable community with the US29 BRT, which is expected to become operational on a time frame concurrent with the Sector Plan, serving as the backbone of the area's revitalization. The Burtonsville Crossroads Neighborhood Plan also envisions a complete community with small businesses, retail, local services, offices, residential, and open spaces, and sees the US29 BRT station as a foundation for improving the area's economy and regional connectivity.

### Attract Tenants to Transit-Accessible Office Space

Montgomery County and the Washington D.C. region are experiencing an unprecedented increase in office vacancies, which negatively impacts the real estate market and more seriously degrades the region's tax base. The office market vacancy rate in the region is 15

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*The most successful office clusters in Montgomery County are part of mixed-use developments with strong sense of place and a quality environment. Transit connectivity is increasingly important to office tenants. This trend is consistent with recommended land use strategies in recent County plans for White Flint, Bethesda, White Oak and other communities.*

- Office Market Assessment, Montgomery County

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*This Plan relies on an efficient and attractive transit network to achieve the vision of transforming this area into a vibrant mixed-use center. The type and level of growth needed to achieve this vision cannot be supported by road improvements alone; there must be a robust transit network that connects the area to the rest of the eastern County and the region's transit and highways.*

-White Oak Master Plan



percent, and a Montgomery County Planning Department report found that “single use office developments without convenient transit or highway access are having difficulty in attracting tenants.”<sup>21</sup> The same report also noted that technology has changed traditional location factors based on knowledge economy workers who prefer “[a]ccess to transit and walkable mixed-use environments where workers can live, eat and play.” In 2014, the office vacancy rate in Silver Spring – which is a more densely developed area – was 11.4 percent, while the vacancy rate along the remainder of the US29 corridor was 12.5 percent. With anticipated job growth on the corridor at 32 percent, the US29 BRT project prioritizes transit oriented development, which the report recommends is the key to reducing vacancy levels.

### Create New Jobs<sup>22</sup>

This project will stimulate the region’s economy through the creation of short-term and permanent jobs. Our analysis of the project’s potential economic impacts (**Appendix B**) anticipates that the development phase will support 531 job-years and \$37 million in labor income statewide. Business sales during this phase will total \$83 million countywide and \$94 million statewide. Montgomery County will work with its private sector partners to promote economic opportunity for all public and private construction related to the project.

Once operational, the project will support 85 permanent jobs within Montgomery County, for a total of 130 full-time jobs statewide. These jobs will be associated with annual labor income of roughly \$6.5 million statewide. Annual business sales will be bolstered by \$13.4 million statewide.

In the long-term, the project will directly contribute to the creation of an even greater number of permanent new jobs in Montgomery County by enhancing the communities near new development in the Silver Spring and White Oak business districts. The corridor is estimated to have job growth of 32 percent by 2040, with estimates as high as 80 percent for Silver Spring and White Oak. In White Oak alone, BRT on US29 could unleash the development of more than 5,300 additional dwelling units in a highly active part of the

**Short term**  
Statewide  
Total Job  
Creation  
(Job Years) **531**

Construction  
Phase  
Statewide  
Labor Income **\$37  
million**

Construction  
Phase  
Statewide  
Business Sales **\$13.4  
million**

**Permenant**  
Statewide  
Total Job  
Creation  
(FTE) **130**

Operating  
Phase  
Statewide  
Annual Labor  
Income **\$6.5  
million**

Additional  
Annual  
Business Sales  
Statewide **\$13.4  
million**



county and lead to the construction of 7 million square feet of commercial space – space that could accommodate more than 20,000 jobs.

## QUALITY OF LIFE

Montgomery County understands the value of Secretary Foxx's and USDOT's mission of bringing people from place to place, and creating opportunities for the places and people in between. **Montgomery County is nationally recognized as one the nation's top places for upward mobility.**<sup>23</sup> The US29 BRT reflects the county's dedication to ensuring the top quality of life for all residents, employees, and visitors by increasing access to high-quality transit to benefit a diverse population, increasing access to jobs centers and access to areas north of the beltway with more affordable housing stock.

*"I know that providing a BRT system will give County residents more time to spend with their family and enjoy leisure activities, and will improve each of our lives."*

- Ike Leggett, County Executive

## Equitable Transit

Single Occupancy Vehicles (SOVs) are the primary travel mode along the US29 corridor and account for 46 percent of all trips. Under current roadway conditions, Maryland State Highway Administration found transit to be noncompetitive compared to automobile travel on US29 due to inefficiency and unreliability. Twelve percent, or nearly 15,000 households, on the corridor do not have access to a vehicle, which is twice as high as the county's average.<sup>24</sup>

For children of parents at the 25th percentile of the national income distribution

Montgomery County ranks **#9 for creating economic opportunity**

Transit trips account for 10 percent of daily US29 trips, but almost 35 percent of the corridor's daily home based work trips. While the US29 corridor is home to 65 percent minority populations, minority populations account for a higher proportion of the 15,000 daily transit riders, between 72 and 82 percent.

- Harvard University: The Impacts of Neighborhoods on Intergenerational Mobility

Each additional year a child spends growing up in Montgomery County **raises their household income in adulthood by 0.52%.**

The US29 BRT project also enhances the walkability and bikability along the corridor, in turn providing additional affordable, efficient, and safe transportation modes to all users. In addition to providing support programs such as Kids Ride Free and Seniors Ride Free, Montgomery County offers free Capital Bikeshare memberships, bike



safety training, helmets and route assistance to low-income residents through the federal Job Access Reverse Commute (JARC) Program.

### Equitable Housing

The suburbanization of poverty is a national trend, and through the US29 BRT project, Montgomery County is working to ensure the built environment does not hinder the area’s affordability. Based on the Center for Neighborhood Technology’s Housing and Transportation Index, the US29 corridor becomes unaffordable as you travel north where the landscape is more auto-centric. For example, in rural Burtonsville, census data shows households on average spend 71 percent of their income on Housing and Transportation Costs.<sup>25</sup> With driving costs as high as \$14,000 a year in these areas, transforming these areas into walkable neighborhood centers will increase the affordability of the corridor.

**Montgomery County is the nationwide leader in providing affordable housing** and has policies in place to ensure the US29’s corridor redevelopment is inclusive of low income populations. The White Oak Science Gateway Master Plan prioritizes retaining and creating new affordable units to ensure redevelopment does not displace disadvantaged communities. In addition to establishing a 12.5% Moderately Priced Dwelling Unit (MPDU) requirement for new residential development, the plan also calls for a comprehensive countywide housing study to ensure redevelopment does not result in rent increases or reduce/eliminate the number of units that are currently market affordable.

### ENVIRONMENTAL SUSTAINABILITY

More than 45 percent of all daily trips on the corridor are in Single Occupancy Vehicles (SOVs). This creates myriad environmental hazards for residents, workers, and visitors to the corridor. In Montgomery County, environmental hazards have a disproportionate impact on minority communities.<sup>26</sup> With 65 percent of the US29 corridor’s population qualifying as minority, the environmental burden of projected increase of 15 percent more Vehicle Miles Traveled (VMT) in the absence of BRT will be more heavily felt among already disadvantaged populations.

The project will promote environmental sustainability by providing the following benefits:

Montgomery County's Moderately Priced Dwelling Units Program	Nation's Longest Running Inclusionary Housing Program
	The most number of affordable units of any community in the county
	More than 14,000 affordable units since 1976
	Serves households at a lower percentage of area median income than served in most other counties







- Reduced travel time and congestion will reduce vehicle emissions of particulate matter, nitrogen oxide, carbon monoxide, Volatile Organic Compounds and carbon dioxide. The value of the air quality savings is approximately \$722,000 (at a 7 percent discount).
- Convert vehicle trips from single occupant vehicle to transit, carpools, bicycling and walking. The BRT will result in an average weekday savings of 33,489 VMT and an average annual savings of 9,711,752 VMT.
- The project includes clean hybrid buses; solar Bikeshare stations; and energy efficient signals.

Figure 8 | Capital Bikeshare Station



## SAFETY

The corridor's current suburban landscape limits alternative forms of transportation due to a lack of convenient, safe access. Creating a safer roadway by integrating multiple transportation options ensures populations with limited transportation choices have alternative, affordable, and safe travel options. The US29 BRT will improve the safety of travel for all modes and users along the corridor, while increasing the accessibility of the regional transportation network by providing:

### Safer and More Inclusive Transportation Options

BRT will incorporate appropriate safety elements into the adaptive transit signal priority (TSP) system design. Specific TSP design safety elements include use of a signal control algorithm that adjust signals to maintain safe and adequate pedestrian crossing intervals where applicable; emergency vehicle pre-emption; and basic timing plans that maintain safe operations requirements.

The BRT project will construct **6,500 feet of sidewalk** along the corridor to improve pedestrian access, ADA accessibility, and safety at BRT facilities, and to ensure safe connections can be made between the BRT facilities and existing rail stations, bus stops, and bikeshare stations.

Figure 7 | Conceptual Covered Bicycle Parking Design





The corridor is an existing “Share the Road” facility for bikers, and the US29 BRT project includes implementing **10 more Capital Bikeshare stations** and **17 covered bike parking shelters** at BRT stops. The Capital Bikeshare system provides users access to 350 stations throughout Montgomery County, Maryland, Washington D.C., Arlington, Virginia, and Alexandria, Virginia, with 58 stations in Montgomery County. Montgomery County is the first jurisdiction in the Bikeshare system to offer low-income residents free Bikeshare memberships, safety training, helmets, and route planning through the federal JARC program.<sup>27</sup>

### Reduce Corridor Crash Rate

The current 14-mile corridor has a significantly higher crash rate than the statewide average for similar state-owned roadways. Roadways with high levels of congestion often experience more safety issues. However, the reduced vehicle miles travelled (VMT) by conversion of auto trips to transit trips and carpools will reduce crash volumes in the corridor. By reducing roadway congestion, vehicle speeds, and implementing necessary pedestrian safety measures, the BRT project will improve safety on the corridor. The value of **safety benefits from reduced crashes will be \$19.6 million per year** (2015 dollars), equivalent to \$151 million when discounted at 7 percent over 21 years.

Between 2011 and 2013 the US-29 Corridor had	1,088 Crashes
	25 incidents involving Peds and/or Bicyclists
	447 Crashes resulting in injuries
	3 Fatalities
	649 Vehicle Occupants Injured

### Secondary Selection Criteria

#### INNOVATION

The US29 BRT is pursuing innovation in advancing the groundwork laid in TIGER One for the region’s real-time transit information screens and transit signal priority efforts.



## Real Time Transit Information (RTTI) Screens

As part of USDOT's TIGER One award, the Washington, DC metropolitan region was able to test and install real time arrival displays on priority corridor Metrobus routes around the region including in Montgomery County. The US29 Bus Rapid Transit project intends to build on this success and install up to 13 new real time travel information screens at stops along the route. The newer screens will show information about Metrorail and Metrobus; commuter rail arrivals; Bikeshare availability; and car sharing proximity. This live technology will increase ridership by improving rider confidence in the bus services, enable transit riders to quickly choose and adjust their preferred mode of travel, and promote the short bus headways available from the US29 Bus Rapid Transit service.

Figure 9 | USDOT TIGER RTTI Screen



## Adaptive Transit Signal Priority

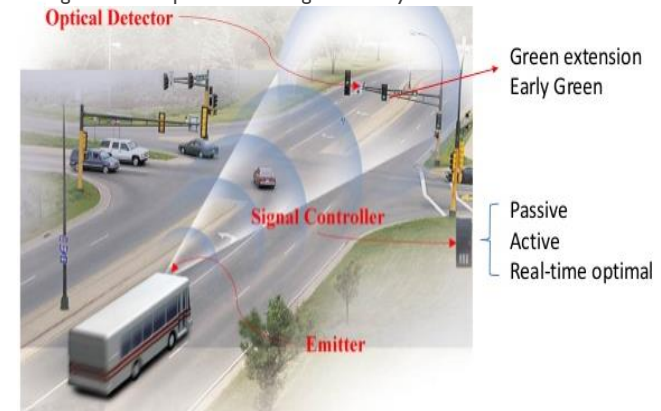
The TIGER US29 BRT project would expand the County's TSP pilot to full implementation at up to 15 intersections on US29. The successful pilot shows that TSP can be implemented smoothly in the County and will help accelerate this key project element. In addition, USDOT TIGER One regional award has provided a number of valuable lessons learned in the testing of TSP technology around the DC region with respect to both fleet and traffic signal system compatibilities. This knowledge will enable easier implementation of the US29 TSP project and provide opportunities for TSP use to be expanded to other local Ride On and WMATA Metrobus routes.

## PARTNERSHIP

Collaboration between Montgomery County, the Maryland State Highway Administration (SHA) and the Maryland Transit Administration (MTA) have been critical in the planning process for this project. This project is being sponsored by Montgomery County with partnership for implementation with SHA and MTA. Howard County and WMATA will also play important participating and coordinating roles.

The County's Corridor Advisory Committees (CACs) of US29 Corridor residents and businesses will continue to meet and provide feedback and input on the US29 BRT. The project team has already seen the benefit of their input in the development of the [US29 Purpose and](#)

Figure 10 Adaptive Transit Signal Priority





**Need Document.** Throughout all phases of the US29 project, Montgomery County will take numerous steps to inform and involve the public and community groups, including holding public meetings, open houses and presentations.

## VI. RESULTS OF BENEFIT-COST ANALYSIS

A formal benefit-cost analysis (BCA) was conducted for the project in accordance with USDOT's recommended methodology for a period of 21 years, starting when operations begin in 2020 and ending in 2040. The project benefits and costs were discounted to current dollars using the USDOT's recommended 7.0% discount rate and the alternative 3.0% discount rate. The BCA ratios, comparing the discounted benefits and costs are summarized in **Appendix C**. All monetized benefits and costs discussed below are in 2015 dollars and reflect net present values (NPV).

The US29 Bus Rapid Transit project costs include design and construction as well as annual operating and maintenance costs. In all, the monetized project cost over 21 years is \$169 million (7.0% discount rate) or \$255 million (3.0% discount rate). While the project requires notable investment, the project's BCA indicates that the benefits greatly outweigh the costs.

Benefit-Cost Analysis Summary (2015\$)		Discount Rate		
		No Discount	7%	3%
<b>Benefits</b>				
Good Repair	Qualitative at this time			
Economic	User Time Savings	\$941,701,154	\$342,409,393	\$593,044,481
Competitiveness	User Cost Savings	\$116,613,017	\$43,796,093	\$74,495,028
Quality of Life	Qualitative at this time			
Sustainability	Greenhouse Gas & Emissions	\$1,738,364	\$721,199	\$1,161,357
Safety	Accident Reduction	\$387,036,916	\$150,727,346	\$251,480,268
<b>Total Benefits</b>		<b>\$ 1,447,089,450</b>	<b>\$ 537,654,030</b>	<b>\$ 920,181,135</b>
<b>Costs</b>				
	Capital Costs	\$195,533,930	\$65,446,024	\$99,652,180
	O&M Costs	\$145,230,733	\$103,547,506	\$125,277,306
<b>Total Costs</b>		<b>\$340,764,663</b>	<b>\$168,993,530</b>	<b>\$224,929,487</b>
Benefits - Costs		\$1,106,324,787	\$368,660,501	\$695,251,648
<b>Benefit Cost Ratio</b>			<b>3.18</b>	<b>4.09</b>

The project is expected to provide substantial benefits in the form of travel time savings for users, reduced vehicle operating costs for motorists who switch to BRT, and crash reductions along key segments of the corridor. When monetized, these benefits amount to nearly \$538 million (7.0% discount rate) or \$920 million (3.0% discount rate) – yielding a benefit-cost ratio of 3.18 to 4.09. Understanding the inherent risks of double-counting benefits, the assumptions used to quantify these benefits were conservative and pragmatic.





The Executive Summary of the BCA, the full BCA report, and the spreadsheet models are all available in **Appendix C** and **Appendix D**.

## VII. PROJECT READINESS

The US29 Bus Rapid Transit project is a result of cooperative regional and local planning and as such, fits the local land use plans in the surrounding corridor. US29 BRT is pursuing an expedited timeline and rapid implementation with operations to begin by the end of 2019. The remaining work for the project is primarily engineering, design and construction, but the relatively simple roadway, signal, and station improvements proposed are not anticipated to result in any delays. This represents a unique opportunity to get a TIGER transit project on the ground in a very short period of time.

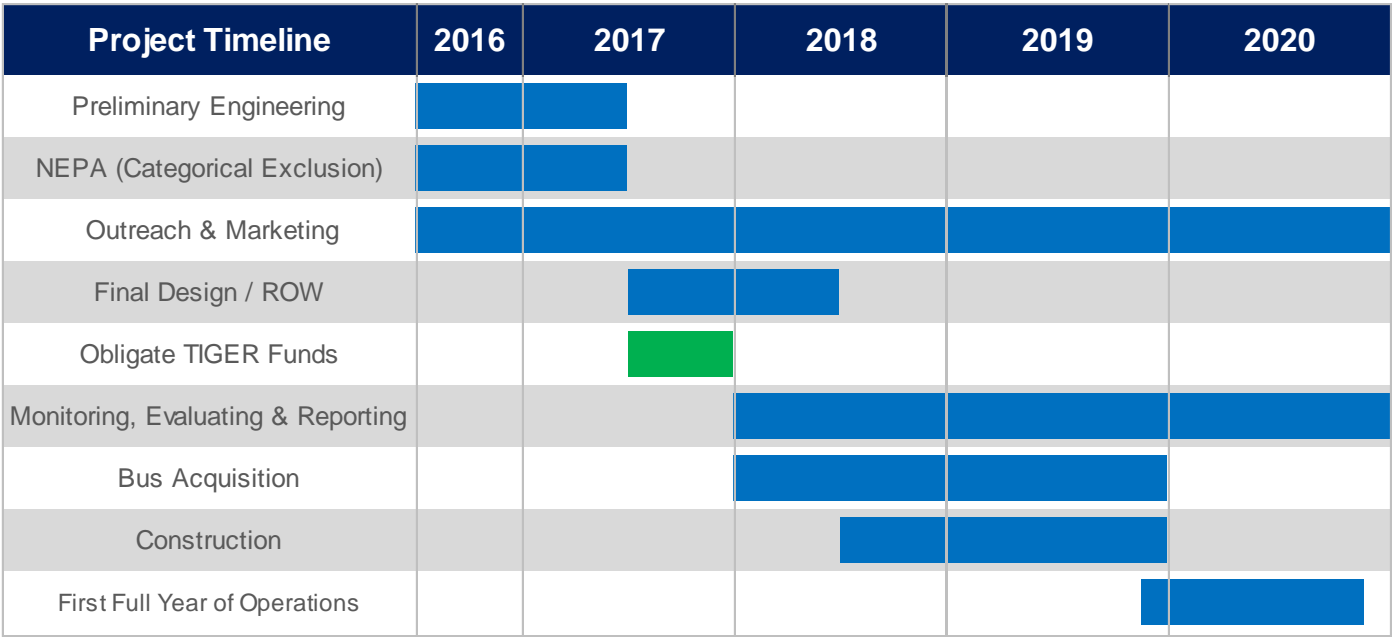


Figure 11 Project Timeline



## Regional, State and Local Planning

The 2011 Countywide Bus Rapid Transit Study recommends BRT for the US29 corridor, as does the Countywide Transit Corridors Functional Master Plan, which was adopted in 2013. US29 BRT is the subject of an ongoing corridor study project led by the Maryland Department of Transportation. The US29 BRT Project Management Team, which includes the highest officials in SHA, MTA and MCDOT, will continue meeting monthly, as it has done since 2014. The National Capital Region Transportation Planning Board has expressed support for the project, as it directly responds to regional transportation goals and priorities.

## Environmental Approval

It is anticipated that the project will qualify for a Categorical Exclusion (CE) due to the limited impacts of this project and according to FTA guidance on NEPA based on 23 C.F.R. §771.118. A specific determination for CE status will be requested from FTA upon successful award.

## Right of Way & Technical Feasibility

US29 BRT will be implemented primarily within the existing ROW. In select locations, stations may be built outside of the existing curbs and may require additional ROW. These minor acquisitions have been included in the station cost and will not impede the project schedule. The US29 BRT Technical Team, which has the support of the MDOT Secretary and includes members of SHA, MTA and MCDOT, will continue meeting regularly, as it has done since 2015.

## Project Schedule

Figure 11 shows the planned schedule for the completion of preliminary engineering, final design and construction of US29 BRT. A determination for CE status will be requested from FTA upon successful award and preliminary engineering for US29 BRT, which is currently underway, will be completed in the 2<sup>nd</sup> Quarter of 2017. MCDOT anticipates that the **TIGER funds will be obligated by the end of 2017**. Final design, which will require approximately 12 months, will be completed in the 2<sup>nd</sup> Quarter of 2018. Construction would then commence in the 3<sup>rd</sup> Quarter of 2018, with expected completion by December 2019 and the opening of US29 BRT as soon as possible thereafter. **Public outreach will continue to be an essential part of the project.**



## Project Risks and Mitigation Strategies

There are minor risks associated with implementation of the US29 BRT project in the context of this application, specifically with regards to property acquisition and bus procurement.

- Potential property acquisition for BRT Stations – In select locations, stations may be built outside of the existing curbs and may require additional ROW. MCDOT and SHA have dedicated, in-house property acquisition teams that will be able to handle the limited number of acquisitions for this project in a timely manner.
- Bus procurement – MCDOT regularly procures buses using Federal Aid. However, this project requires articulated BRT vehicles which are not in our current bus contract and will therefore require a separate procurement. MCDOT's ability to begin BRT operations by the end of 2019 depends on procuring and receiving the buses in a timely manner. In order to minimize the risk of delays, MCDOT has built 18 months into the schedule to purchase BRT buses.

## VIII. FEDERAL WAGE RATE CERTIFICATION

The Federal Wage Rate Certificate is attached as **Appendix E**.



- <sup>1</sup> US Census 2000, US Census 2010, ACS 2015
- <sup>2</sup> Metropolitan Washington Council of Governments, Household, Population and Employment Projection, Round 8.2.
- <sup>3</sup> Unless otherwise specified, “the corridor” refers to a half-mile radius around planned BRT stations.
- <sup>4</sup> HUD FMR Income Limits for Montgomery County, MD 2015.
- <sup>5</sup> [“Affluent Montgomery County has pockets of poverty, mostly in the east.”](#) Bill Turque, Washington Post. September 6, 2014.
- <sup>6</sup> [US29 Bus Rapid Transit Corridor Planning Study Preliminary Purpose and Need Document](#). Maryland Department of Transportation. December 2015.
- <sup>7</sup> US29 Bus Rapid Transit Corridor Planning Study Preliminary Purpose and Need Document.
- <sup>8</sup> [White Oak Sciences Gateway Master Plan, Montgomery County Planning Department](#). Approved and Adopted, July 2014.
- <sup>9</sup> US29 Bus Rapid Transit Corridor Planning Study Preliminary Purpose and Need Document.
- <sup>10</sup> White Oak Sciences Gateway Master Plan.
- <sup>11</sup> [Burtonsville Crossroads Neighborhood Plan, Montgomery County Planning Department](#). Approved and Adopted 2012.
- <sup>12</sup> US29 Bus Rapid Transit Corridor Planning Study Preliminary Purpose and Need Document.
- <sup>13</sup> ACS, 5-Year, 2010-2014. Household Size by Vehicles Available.
- <sup>14</sup> “Affluent Montgomery County has pockets of poverty, mostly in the east.” Bill Turque, Washington Post. September 6, 2014.
- <sup>15</sup> Benefit Cost Analysis for US29 BRT. Sabra, Wang & Associates, April 2016.
- <sup>16</sup> [“Transportation Emerges as Crucial to Escaping Poverty.”](#) The New York Times, May 7, 2015.
- <sup>17</sup> US29 Bus Rapid Transit Corridor Planning Study Preliminary Purpose and Need Document.
- <sup>18</sup> US29 Bus Rapid Transit Corridor Planning Study Preliminary Purpose and Need Document.
- <sup>19</sup> “Affluent Montgomery County has pockets of poverty, mostly in the east.” Bill Turque, Washington Post. September 6, 2014.
- <sup>20</sup> Benefit Cost Analysis for US29 BRT. Sabra, Wang & Associates, April 2016.
- <sup>21</sup> [Office Market Assessment: Montgomery County, Maryland](#). Montgomery County Planning Department, 2015.
- <sup>22</sup> The Prospective and Likely Economic Implications of the US29 BRT System. Sage Policy Group, Inc., April 2016.
- <sup>23</sup> [The Impacts of Neighborhoods on Intergenerational Mobility: Childhood Exposure Effects and County-Level Estimates](#). Harvard University, 2015.
- <sup>24</sup> Montgomery County 7.5%, US-29 Corridor: 12.1% (Silver Spring Station 20%, White Oak/Four Corners Station 7.6%, Burtonsville/Fairland Stations 9.5%)  
Table B08201 Household Size by Vehicles Available (by Census Tract), ACS 2010-2015, 5-year sample.
- <sup>25</sup> [Center for Neighborhood Technology](#). The Housing and Transportation Index. See “Montgomery County, Maryland.”
- <sup>26</sup> [Scorecard: The Pollution Information Site](#). Montgomery County, Maryland Summary Report.
- <sup>27</sup> [Montgomery County Bikeshare](#). Montgomery County Government.